

419-7.

X-RAY REFLECTORS



SHOW-
WINDOW
Illumination
SEARCHLIGHTS

Imitations of X-RAY Re-
flectors have proven costly
experiments to the trade and
to the *consumer*.

"They copied all they could follow,
But they couldn't copy my mind;
And I left them, sweating and stealing,
A year and a half behind."

—Rudyard Kipling.



REFLECTORS

(PATENTED)

The Most Powerful Reflectors Made
Scientifically Designed
Everlasting

This means to you:

1. Much brighter windows from the same wattage, or same amount of light with great saving in light bill.
2. No light wasted on ceiling or sidewalk.
3. Concealed lamps, giving a display like the stage in a theatre.
4. A uniform light, and all on the goods displayed.
5. Everlasting brilliancy. The reflectors cannot tarnish.

Made Only By

National X-Ray Reflector Co.

General Offices
235 W. Jackson Blvd.,
CHICAGO

New York Office
14 W. 33rd St.
Opposite the Waldorf

CORRECT PRACTICE

in lighting show windows

MODERN business methods demand the use of the most efficient equipment available. On every side waste is being eliminated. No mercantile establishment could exist if the same ratio of waste were permitted in all departments as is found in the lighting of show windows where the usual obsolete methods are in use.

The progressive merchant no longer buys his equipment in a hit or miss way. He seeks the most modern and effective devices. He buys equipment to do one of two things (1) save money or (2) increase sales.

In no way has he been so handicapped as in properly lighting his windows, i. e., lighting them in a way which will display *the merchandise* he is offering, and *not his lighting fixtures*.

The window display should be brightly illuminated, but lamps should not be placed where they are seen, as the delicate organs of the eye are affected by bright light sources and the seeing power of the eye is greatly lessened. It is somewhat like the blindness occasioned when looking into the sun. This is now a well recognized principle and cannot be too strongly emphasized. Reflectors should be designed so as to protect the eye of the person looking at the display in the window; all of the light should be reflected down on the display, and for economical results no light should be wasted on the ceiling of the window or sidewalk.

Proper Equipment

X-RAY reflectors are the result of painstaking research by expert illuminating engineers. They are the only reflectors made exclusively for window lighting. The merchant will have no difficulty in selecting one from this line which will correctly and economically illuminate his windows.

These X-RAY reflectors, are recognized as the standard equipment for window lighting. Observation in any town or city will show X-RAY reflector windows in a class by themselves.

Permanency

The special process used in pure-silver plating X-RAY mirrored reflectors, which makes their efficiency permanent, is the result of exhaustive experiments and tests. Years of daily use in no way reduce the brilliancy of these reflectors, as is conclusively proven by the test of time. X-RAY reflectors have been in use since 1898. Reflectors picked at random from installations made 12 years ago, tested by disinterested engineers, **showed a loss of less than 1%** in reflecting efficiency. Attempts to imitate X-RAY reflectors have been made several times. These have proved costly experiments to both the users and the trade.

Efficiency

X-RAY reflectors are not only of correct shape but have the most powerful reflecting surface known, a **pure silver**—not quick-silver—mirror. Therefore, to produce the desired degree of brightness of illumination, less current is needed than with any other reflectors manufactured.

Low Lamp-Breakage Cost

Besides the other acknowledged superior advantages of X-RAY reflectors, such as efficiency, permanency, etc., it has been proved that the upkeep or maintenance of these reflectors is much less than any other type.

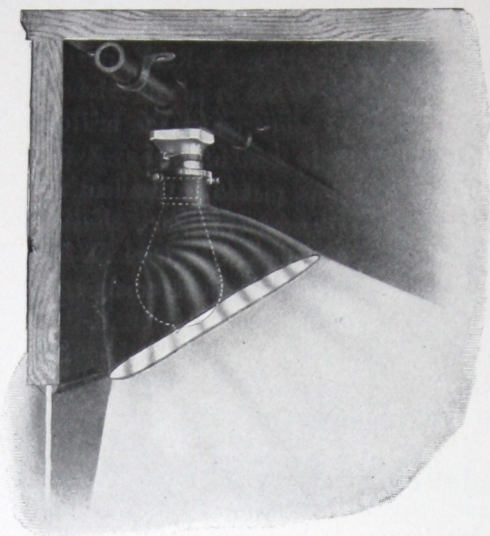
First:—**Lamp Breakage.** In the design of these reflectors sufficient room has been allowed for cleaning without removing lamps from reflectors, thus reducing the lamp breakage to a minimum—a very important consideration, as the merchant will appreciate.

Second:—**In Cleaning.** The inside glass protection to the silver plating is easily cleaned by simply wiping (inside of reflector only) with a damp cloth. They need not be cleaned as frequently as other types, and should never be immersed in water.

Engineering Reports Free

This book should enable you to select the correct reflector and lay out your own installation. Should there be any question in your mind, or if the windows under consideration are out of the ordinary, send in a sketch showing depth, width, ceiling height and a general idea as to kind and height of background, etc.

TD 90-0316A 101



The **Scoop** No. 777

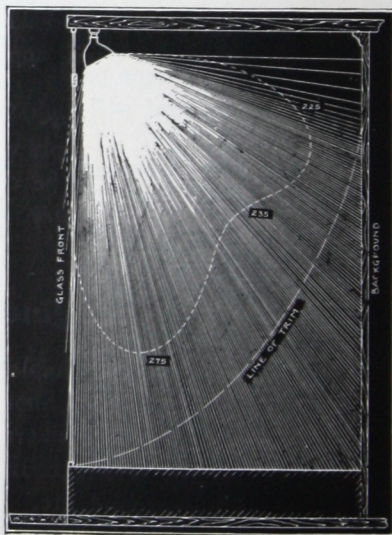
A N X-RAY Reflector for
ordinary size windows

THE "Scoop" is designed to illuminate windows of average size; i. e., where the depth is about 70 per cent of the height, and where trim is made high in back of windows. No light will be wasted on the ceiling of the window or sidewalk. Either 40 or 60 watt Mazda lamps can be used in the "Scoop." Like all X-RAY reflectors it is of one-piece mirrored glass. It is pure silver plated, and corrugated to break up the light rays. The result is the even flood of brilliant illumination so necessary to bring out the merchandise display in all its effectiveness.

The figures in diagram show the great candle power projected on the line of trim with a 60 watt skirted base Mazda lamp. Socket extensions are necessary with unskirted base lamps.

Scoop

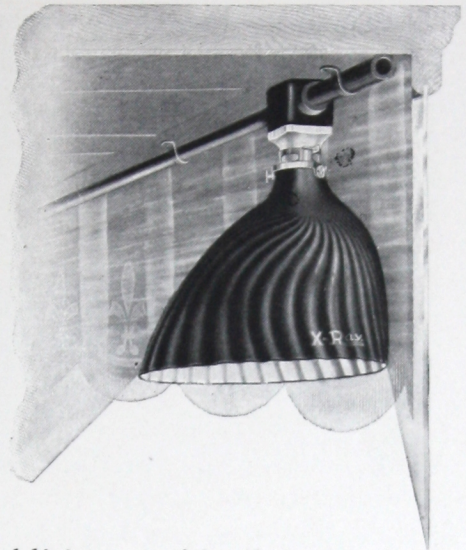
Width, $10\frac{1}{4}$ in.
Depth, front to back, $8\frac{1}{8}$ in.
Height, including neck, $6\frac{1}{2}$ in.
For 40 and 60 watt Mazda lamps.
Holder $2\frac{1}{4}$ in. form "H."
Standard package quantity, 15.
Price, Reflector only, \$3.00.



Cross section of window showing distribu-
tion of light from Scoop with
60-watt Mazda lamp.

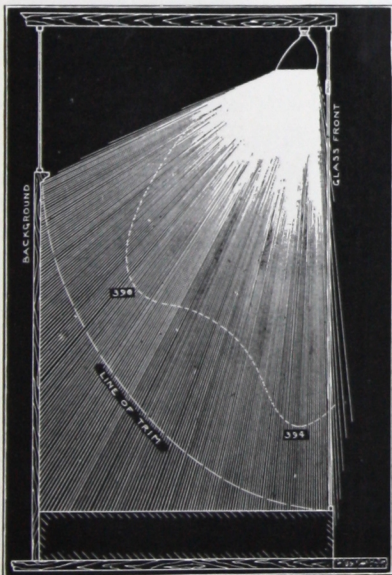
The Visor No. 780

AN X-RAY Reflector designed
for windows with glass, mirror,
or low backgrounds



THIS is the most recent addition to this line of show window searchlights. Especially designed to illuminate the average size window (where the depth is approximately 60 to 70% of the height), but which have low or glass top backgrounds. The reflector controls the light so as to brilliantly illuminate the entire display in the window. It cuts off the light at top of background so none will go over the top or through the glass portion of the background into the store. This reflector covers the lamp in such a way that, from the sidewalk, one cannot see the reflection of the lamp in the glass or

mirror background. While from within the store, the customers' eyes are not affected by the exposed lamps when looking toward the window. Designed for use with 100 watt lamps; 60 watt lamps may be used where less distribution and more concentration is desired. Socket extensions are necessary with all unskirted base lamps.



Cross section of window showing distribution of light from Visor with 100-watt lamp.

Visor

Width, $9\frac{1}{2}$ in.

Depth, front to back, $10\frac{5}{8}$ in.

Height, including neck, $9\frac{3}{16}$ in.

For 60 and 100 watt Mazda lamp.

Holder, $2\frac{1}{4}$ in. form "H."

Standard package quantity, 4.

Price, Reflector only, \$4.00.



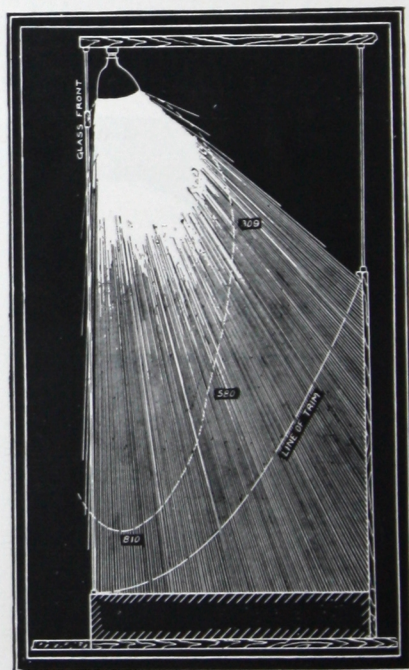
The Helmet No. 755

AN X-RAY Reflector for
high and shallow windows

THE X-RAY reflector called the "Helmet" is the most powerful concentrator of light ever made for show window lighting, it is specially designed for the brilliant lighting of high, shallow windows. It has been adopted by many of the largest and best stores in the country. It is the only reflector which, when installed 12 feet or more from the floor, will produce the brilliant and intense illumination necessary to make successful the selling displays required in modern stores. The "Helmet" is easily installed and is usually attached to the ceiling of the window. When used in connection with 100-watt Mazda lamp, this reflector produces over 800 downward candle power. 150-watt lamps can also be used with the "Helmet," and a 60-watt when used with socket extension. Socket extensions are necessary with unskirted base lamps.

Helmet

Width, 12 in.
Depth, front to back, $11\frac{3}{4}$ in.
Height, including neck, 10 in.
For 60, 100 and 150 watt Mazda lamps.
Holder, $3\frac{1}{4}$ in. form "A."
Standard package quantity, 4.
Price, Reflector only, \$5.00.

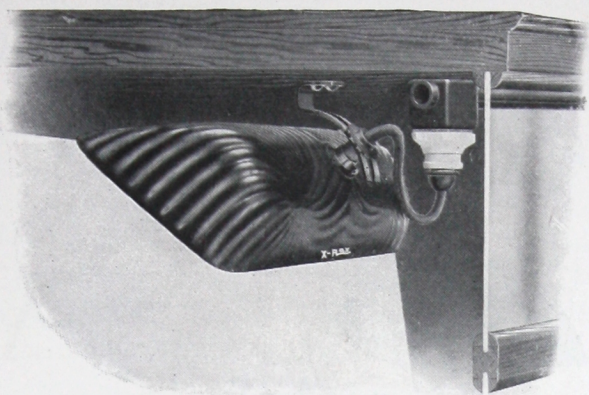


Cross section of window showing distribution of light from Helmet with 100-watt lamp.

The Poke Bonnet

No. 750

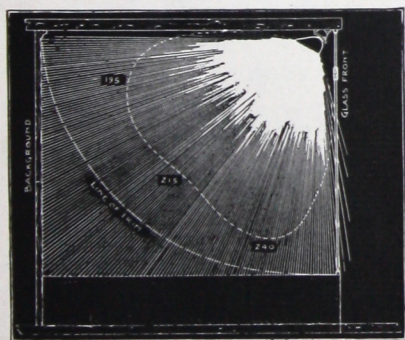
AN X-RAY Reflector for
low and deep windows



THIS reflector is designed for very wide distribution and is especially well adapted for use in windows with low ceilings where objections might be raised to the usual methods employed to hide the ordinary type of reflector. The total distance from top to bottom of this reflector, including sockets and lamps, is $5\frac{1}{2}$ inches.

The Poke Bonnet is provided with an adjustable fork permitting very easy adjustment to any desired angle, so as to get the maximum benefit from the great reflecting surface.

This is an ideal reflector for use in lighting large show and wall cases, and also for pictures, rugs, etc. Note illustration of cross section of a low and deep window, which shows the reflector adjusted at an angle so as to distribute the light evenly over the entire window. Note also the candle power produced at various points with 2-40 watt Mazda lamps.



Cross section of window showing distribution of light from Poke Bonnet with two 40-watt lamps.

Poke Bonnet

Length, 14 in.

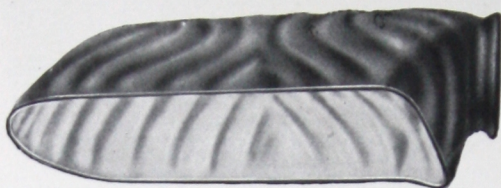
Depth, $7\frac{1}{2}$ in.

For 25 watt standard base, or 40 and 60 watt unskirted base Mazda lamp.

Special adjustable holder.

Standard package quantity, 8.

Price, wired, with holder, attachment plug, sockets, complete, \$6.50.



The Midget No. 510



A SMALL X-RAY Reflector
for use with tubular lamp

LOWEST cost for current and maintenance per foot illuminated has been attained with the Midget. It uses the new 25-watt **tubular** Mazda lamp, and is the ideal reflector for lighting show-cases, small store windows, wall-cases, cornices, pictures, etc.

It has the high efficiency, permanency and the correct design common to all X-RAY reflectors. It does not require special socket arrangements as it fits the standard Edison base socket, is easily attached and stands firmly and rigidly in place. Each Midget reflector and lamp is an entirely independent unit and the burning out of one will not affect others on the same circuit. The uniform white light of the tungsten filament lamp is thus made available for the display of merchandise in its true colors.

Midget

Size: $6\frac{3}{8}$ in. long, $3\frac{7}{8}$ in. across mouth, $1\frac{3}{4}$ in. high.

For 25 watt Mazda tubular lamp.

Holder, $1\frac{1}{8}$ in., Hubbell No. 5590, 10c.

Standard package, 36.

Price, Reflector only, 80c.

An X-RAY Reflector for Every Purpose

NO matter what the problem, there is an X-RAY reflector designed for the special purpose of solving it. While the reflectors shown in this booklet are designed for show window lighting, there are a number of special uses for which some of them are adapted, such as rug racks, picture gallery and display case lighting. We also make a complete line of entirely differently designed X-RAY reflectors for direct lighting in store-rooms, basements, shops, warehouses, factories, etc. Likewise it was the great efficiency of X-RAY reflectors that made indirect lighting possible. (See page 16.)

Positive Proof

**Comparative Tests by Disinterested
Engineers Show the Great Superiority
of X-RAY WINDOW REFLECTORS**

MANUFACTURERS of appliances for window lighting were recently requested by a firm of consulting engineers in New York City to participate in a series of tests run under the direction of the Electrical Testing Laboratories of New York. Practically all responded and representatives of the different firms were present at the tests.

The tests were run in an average size window; hundreds of readings were taken. The lamps were standardized; the instruments calibrated before and after the tests. The readings were all corrected to the same basis of wattage consumption to make the comparisons exact. By far the greatest intensity was secured with the X-RAY reflectors.

The results, in summarized form, were as follows:

Comparative Efficiencies on Basis of X-RAY Taken as 100%

	X RAY Silvered Reflectors.	Prismatic Reflectors.	Latest Mirrored Trough Reflectors.
Bottom of Window.....	100%	77.5%	35.6%
Back of Window.....	100%	59.7%	58.1%

Other reflectors originally entered in the competition were withdrawn before the tests were completed. Hence the above are the only authentic comparisons available.

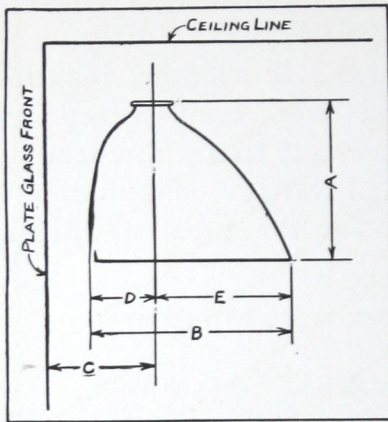
Exact data on the tests, including information on the number of reflectors, size of lamps, etc., etc., will be furnished upon application to those interested.

Engineering Department, National X-RAY Reflector Co.

This department is responsible for some of the most noteworthy lighting successes of recent years in solving Show Window, Indirect and Industrial Direct Lighting problems. They are at your service for the solution of your lighting problems of any kind.

Installing Information

THE diagram below, used in connection with the table, enables anyone to easily lay out an installation of X-RAY reflectors. It shows the space occupied by the various X-RAY reflectors in the top of the window. The dimension "C" to the center of the socket may be varied somewhat, depending upon the construction of the window front. This dimension



"C" as given in the table is ample to allow for cleaning the window without removing the reflector, and for the placing of a drape or shade between the reflector and the glass.

The number of reflectors to use is optional with the merchant. No set rule can be established. It is influenced by a number of conditions, such as the brightness of neighboring windows, the intensity of the street illumination, kind of goods on display, color and nature of background in window, and largely the extent of the merchant's realization of the advertising and selling value of bright windows.

The closer the reflectors are spaced, the brighter the window becomes, and vice versa.

In average installations the spacing, or distance from center to center for these reflectors, is about as follows:

Scoop	- - - -	15 in.
Visor	- - - -	24 in.
Helmet	- - - -	36 in.
Poke Bonnet	- -	24 in.

Reflector	A	B	C	D	E	Width	Size of Holder
Scoop	6½"	8⅛"	6½"	3⅞"	4¼"	10¼"	2¼"
Visor	9⅜"	10⅝"	6"	3⅝"	7¼"	9½"	2¼"
Helmet	10"	11¾"	7¼"	4⅜"	7⅜"	12"	3¼"
Poke Bonnet	5"-7"	7½"	4¾"	2½"	5"	14"	Special

The Chart on the Next Page

THIS chart makes easy the selection of the correct reflector for any type of window. To start with, knowledge of three things is necessary: Height, Depth of Window and Height of Trim at back ground.

Suppose, for example, the show window is 10' high, 6' deep and the trim or background to be lighted is 6' high.

First, find the height of the window (10') on the left hand vertical scale, we have marked this point "A."

Second, locate depth of window (6') on lower horizontal scale, which distance is indicated by "B."

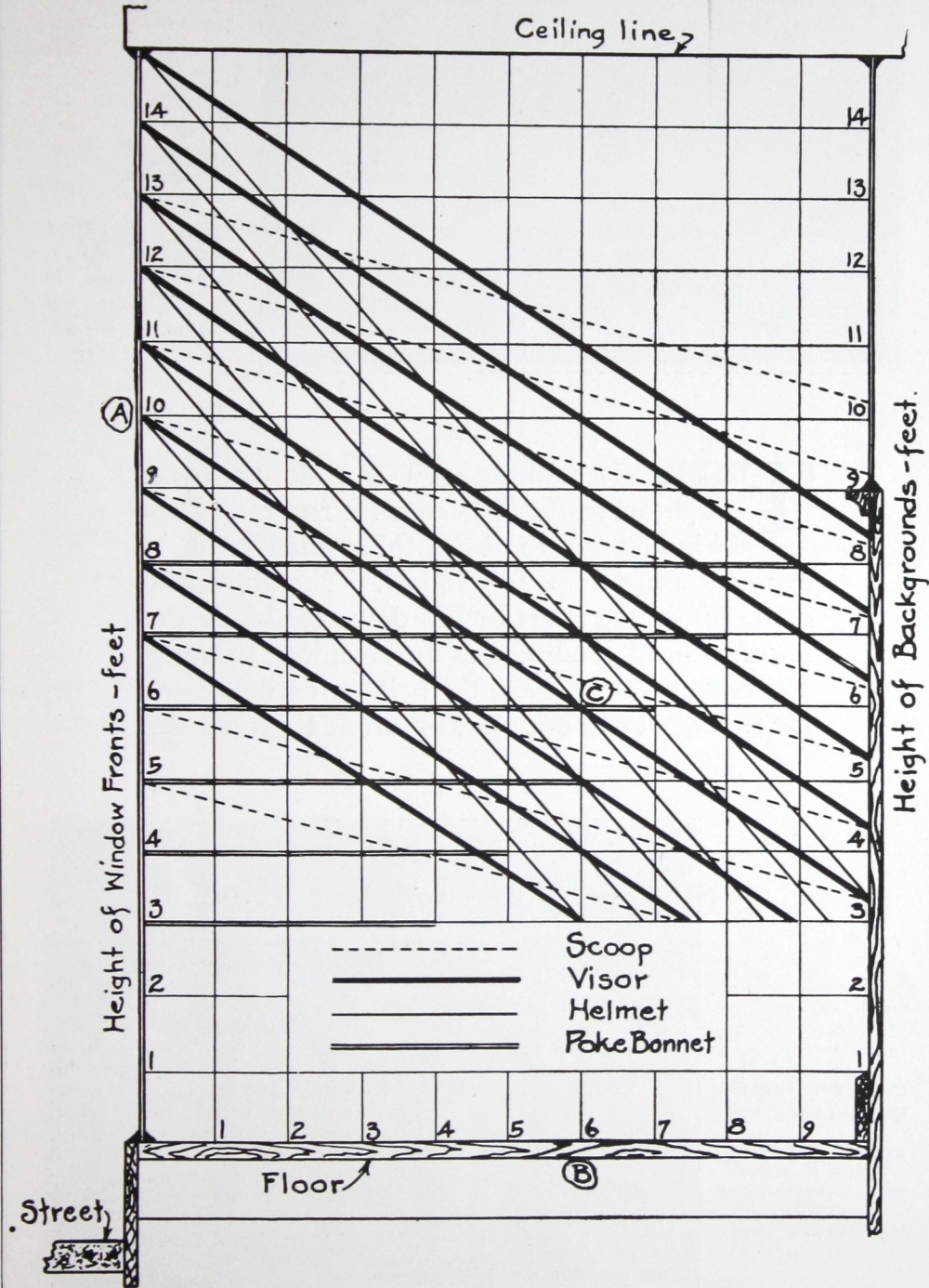
Third, move straight up from here to

a point corresponding to the highest point to which the window is trimmed (in this case 6') we have marked this point "C."

Now, note the diagonal line that comes most nearly passing through the two points, "A" and "C" (which in this case is a heavy dark line). By referring to the key below we find the reflector designated by the heavy dark line (—) is the "Visor," which is the correct reflector for this window. In the above example, if the window were 12 feet high the chart calls for a "Helmet" reflector. This chart is based on the use of the lamp for which each reflector is designed.

Chart for Determining the Right Reflector

(See instructions for use at bottom of preceding page.)





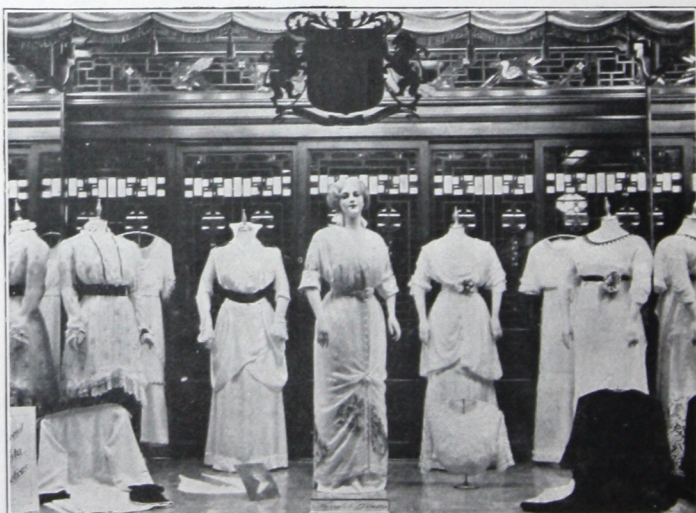
THE HUB
Chicago, Ill.

Lower show window
—11 ft. high, 6 ft.
deep.

Helmet reflectors—15
in. apart.

Using 100-watt Mazda
lamps.

THERE is nothing you can do to make it difficult for a person in front of your window to see the display than to have exposed lamps in your window. The store next door, across the street or just down the block imposes a rigid requirement for window lighting. Your store should have the brightest windows on the street, but without glare or visible light sources.



HARRY H. BLUM
Chicago, Ill.

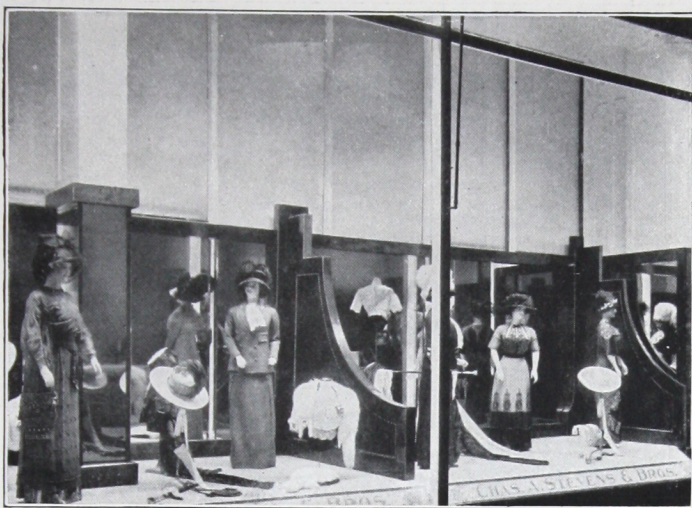
Show window—14 ft.
high, 8 ft. deep.

Scoop reflectors—14
in. apart.

Using 60-watt Mazda
lamps.

**CHAS. A.
STEVENS & BROS.**
Chicago, Ill.

Show window—16½
ft. high, 8 ft. deep.
Helmet reflector—16
in. apart.
Using 100-watt Mazda
lamps.

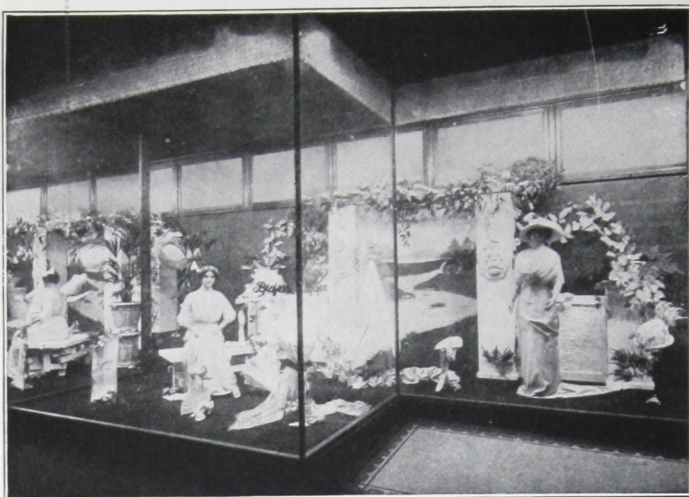


UNIFORM lighting makes displays attractive. X-RAY reflectors are especially designed to accomplish this very thing and *they do it*. The great number of glaring and blotchily lighted windows along the street and the great waste of light shows the necessity for more serious thought on the window lighting problem, and the crying need for scientific equipment.



FELIX & SONS
Kansas City, Mo.

Show window—9 ft.
high, 6 ft. deep.
Scoop reflectors—15
in. apart.
Using 60 watt Mazda
lamps.



PFEIFFER BROS.
Little Rock, Ark.

Scoop reflectors—18
in. apart.
Using 60 watt Mazda
lamps.

FOR high class shops, the prominence and importance of the show window is such as to make a selection of its lighting equipment a crucial matter. X-RAY reflectors are concealed by the draped curtain in the window shown above, and it is not hard to see that this is an example of effective window display—putting the maximum “pull” into the merchandise shown.

The class of goods displayed has a great influence on the amount of light necessary. Light colored goods, of course, require less than darker fabrics and materials.



GROCERY STORE
Chicago, Ill.

Show Window—12 ft.
high, 3 ft. deep.
Helmet reflectors—6
ft. apart.
Using 100-watt Maz-
da lamps.

Installations

Thousands of installations of X-Ray window lighting reflectors have been made. Below we list only a few selected from the "four winds." Many of the biggest stores in the country are in this list.

MASSACHUSETTS

Filene Store Boston

NEW YORK.

R. Smith & Co. New York City
Cammeyer Shoe Co. New York City
Walkover Shoe Co. New York City
Siegel, Cooper Co. New York City
Frazin & Oppenheim. New York City
The Bedell Co. New York City
S. Hirsh's Sons. Niagara Falls
Klemhaus Clo. Co. Buffalo

PENNSYLVANIA.

Browning, King & Co. Pittsburg

WEST VIRGINIA.

Stone & Thomas. Wheeling

OHIO.

Bornheim & Cohen. Columbus
Burkhardt Bros. Cincinnati
Geo. W. McAlpin Co. Cincinnati
Klene Bros. Cincinnati
Walkover Shoe Co. Cincinnati
Florsheim Shoe Co. Cincinnati
Continental Clo. Co. Dayton

KENTUCKY.

Kaufman, Straus & Co. Lexington
The Model Lexington

ALABAMA.

J. Black & Co. Birmingham
Nachman & Meertief. Montgomery

MISSISSIPPI.

J. Perlinsky & Son. Canton

INDIANA.

Traugott Bros. Indianapolis
Marratt Dept. Store. Indianapolis
Keller Bryce Co. Muncie
Thos. Israel. Ft. Wayne
Goldthaite & Sons. Marion
Adler Bros. So. Bend

ILLINOIS.

The Leiser Co. Chicago
Cable Piano Co. Chicago
The Hub Chicago
Chas A Stevens & Bros. Chicago
Harry H. Blum. Chicago
Wells Clothes Shop. Chicago
Famous Clothing Co. Chicago
Maurice L. Rothschild. Chicago
The Fair Chicago
Almer Coe & Co. Chicago
Capper & Capper. Chicago
M. & K. Clothing Co. Rock Island

MICHIGAN.

Hickey & Co. Detroit
Harris Kaplan. Detroit
Houseman & Jones. Grand Rapids

WISCONSIN.

The T. A. Chapman Co. Milwaukee
Boston Store Milwaukee

MINNESOTA.

Boutel Bros. Minneapolis
L. S. Donaldson. Minneapolis
The Plymouth Minneapolis
New England Furn. & Carpet Co. Minneapolis
Field, Schlich & Co. St. Paul
Manheimer Bros. St. Paul
Thoen Bros. St. Paul

IOWA.

Miller & Guerenan. Davenport
Palace Clothiers. Waterloo
Harris Emery Co. Des Moines
T. R. Glanville. Mason City

MISSOURI.

The Model St. Louis
The Famous. St. Louis
Browning, King & Co. St. Louis
Mermod Jaccard Jewelry Co. St. Louis
Greenfield Bros. St. Louis
Sonnenfelds. St. Louis
Garrett & Son. St. Joseph
John Taylor. Kansas City
Felix & Sons. Kansas City

ARKANSAS.

Pfeifer Bros. Little Rock
C. A. Kessler. Little Rock

TEXAS.

Sanger Bros. Dallas
Dreyfus & Son. Dallas
Washer Bros. Ft. Worth
White House. El Paso
Jordt-Allen Furniture Co. Corpus Christi

OKLAHOMA.

Durant Merc. Co. Durant
Pegrem D. G. Co. Muskogee
New Phoenix. Muskogee

KANSAS.

Strausburger, D. G., Co. Parsons
The Leader Parsons

NEBRASKA.

Mayer Bros. Lincoln

MONTANA.

J. A. Berger. Great Falls
J. H. Thies. Hamilton
Siegel Clothing Co. Butte

COLORADO.

Denver D. G. Co. Denver
The W. S. Moyer Merc. Co. Grand Jct.

ARIZONA.

New York Store. Phoenix
E. F. Sanguenetti. Yuma

UTAH.

Wright & Son. Ogden
Siegel Clothing Co. Salt Lake City
Rome & Kelley. Salt Lake City
H. W. Desky. Salt Lake City
Walker Bros. D. G. Co. Salt Lake City

IDAHO.

The Hub Pocatello

WASHINGTON.

Berry Dept. Store. Spokane
Crescent D. G. Co. Spokane
Palace Dept. Store. Spokane
John W. Graham & Co. Spokane
Rhodes Bros. Seattle
Frederick Nelson & Co. Seattle
McDougal-Southwick. Seattle
Stone-Fischer & Co. Seattle
The Bon Marche. Seattle
Gardner & Co. Walla Walla

OREGON.

Olds, Worthman & King. Portland
Holtz, Inc. Portland

CALIFORNIA.

Jackson Furniture Co. Oakland

CANADA.

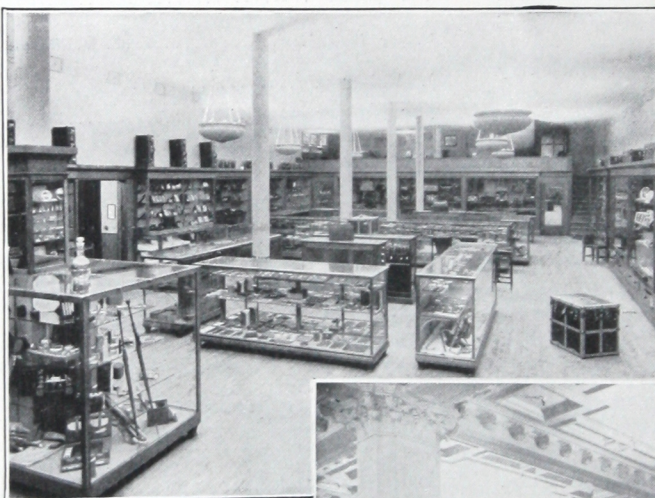
A. D. Rankin & Co. Brandon
F. Simard & Co. Quebec
Ortenberg & Co. Quebec
T. Eaton. Toronto
Robt. Simpson. Toronto
Goodwins, Ltd. Montreal
David Spencer. Vancouver
Peace & Co. Winnipeg
Fairweather & Co. Winnipeg
R. McKay Co. Hamilton

Lighting the Store by the Indirect Method Eye Comfort Lighting System

THE success of X-RAY reflectors for window illumination was so great and so immediate that it led to experiment and development along other lines. This development produced the **Eye Comfort Lighting System** for interior illumination. It is the greatest achievement of recent years in interior lighting.

Naturally, the **Eye Comfort Lighting System** has been followed by imitations. Imitations are unsuccessful, however, because it is only possible to secure the desired economic results with indirect illumination by the use of our specially designed X-RAY reflectors and equipments.

Merchants are always on the alert to increase the selling facilities of their stores. The wide, even distribution of light, the softening of harsh shadows, and the absence of all glaring light sources afforded by the **Eye Comfort Lighting System** will do more to bring about this result than any other improvement which can be installed. Eye Comfort Lighting is fully as desirable for small as for large stores. See opposite page for list of publications.



**BARNUM
TRUNK CO.
Minneapolis, Minn.**

**THE HUB
Chicago, Ill.**

(Showing luminous
bowl indirect lighting
—not so called "semi"
indirect.)



**Publications of the National X-Ray Reflector Co., Chicago.
Copies of Which Will Be Furnished On
Application To Those
Interested**

EYE COMFORT LIGHTING SYSTEM

Correct Practice in Control of Light.—By Augustus D. Curtis describing the origin and development of indirect lighting and explaining the "semi-indirect" fallacy.

Office, Bank and Store Illumination.—Illustrating the efficient lighting of the most modern interiors in these classes.

Church Illumination.—The scientific illumination of the House of Worship.

Motion Picture Theatre Pamphlet.—The Eye Comfort Lighting System as applied to the small theatre.

Indirect Lighting in Auditoriums.—A reprint from the transactions of the Illuminating Engineering Society.

The Curtis Portable.—Description and prices of this wonderful new art lamp which combines useful indirect illumination with its decorative feature.

Engineering Bulletin No. 3.—A terse, technical explanation of the method of laying out and figuring scientific installations of the Eye Comfort Lighting System.

Cost Comparisons.—Reprint of an article which appeared in "Good Lighting," giving figures to illustrate the comparative cost of direct and indirect lighting.

Photogravures of Fixtures.—Showing representative designs in the EYE COMFORT line.

Photogravures of Installations of the Eye Comfort Lighting System in prominent interiors.

DIRECT LIGHTING

Catalog 16.—Containing prices on all X-Ray reflectors.

Greatest Efficiency in Reflection of Light.—Describing and illustrating the many uses of X-Ray Direct Lighting reflectors.

Acknowledgment

GRATEFUL acknowledgment is made here to the many Retail Merchants, Window Decorators and Illuminating Engineers whose valuable co-operation has so greatly assisted us in evolving the correct, economical and efficient lighting of modern window displays.

This revised book on "Correct Practice" in store window lighting shows how thoroughly the development of this unexcelled line has been perfected.

This is a product of many minds, much time and painstaking effort.

Not only does the modern artistic display of merchandise in American store windows increase sales, but it makes for an attractive city and educates the public toward harmony.

We feel that our efforts to add proper illumination to the ever-changing window-pictures created in the mercantile establishments of the country will be appreciated.

A stylized, handwritten signature in black ink, reading "A. D. Curtis". The signature is fluid and cursive, with a long, sweeping horizontal stroke at the end.

President

National X-Ray Reflector Co.

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CCA